

R E M A R K S

Claims 1-19 are pending and stand ready for further action on the merits.

Support for new claim 19 can be found on page 23, lines 5-16 and page 28, lines 18-25 of the present specification. No new matter has been added by way of the above amendments.

The above amendments neither narrow the scope of the claims nor have been made for the sake of patentability.

[I] Prior Art Based Rejections

The following rejections are pending:

- (a) Claims 1-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Shiraki et al. (U.S. Patent 5,332,784) and
- (b) claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiraki et al. in view of Shibuya et al. (U.S. Patent 4,863,997).

Applicants respectfully traverse each of the rejections.

[II] Anticipation Rejection

Present claims 1-3 recite a resin composition containing a graft copolymer obtained by reacting;

- (a) an amino group-containing hydrogenated block copolymer obtained through hydrogenation of an amino group-containing block copolymer; with

- (b) a functional group-containing polyphenylene ether having any one functional group selected from the group consisting of a carboxyl group, an acid anhydride group and an epoxy group; and/or
- (c) a functional group-containing polyolefin having any one functional group selected from a group consisting of a carboxyl group, an acid anhydride group and an epoxy group.

One of the important features of these claims is that a polyphenylene ether and/or a polyolefin should be reacted with any one selected from a carboxyl group-containing compound, an acid anhydride group-containing compound and an epoxy group-containing compound and as a result, a polyphenylene ether and/or a polyolefin having such a specific functional group is formed (see page 24, lines 10-16 and page 28, lines 18 to 25 of the present specification).

On the other hand, Shiraki '784 discloses a composition, which comprises a terminal-modified block copolymer and a resinous substance, which comprises at least one highly water-absorbing crosslinking resin or at least one polar thermoplastic polymer (for example, see claim 10 of Shiraki '784).

Shiraki '784 illustrates polyethylene-type resins, polyphenylene ether-type polymers, etc. as usable thermoplastic polymers in the water absorbing composition (see column 16, lines 19-64 of Shiraki '784). Moreover, Shiraki '784 says that particularly preferable thermoplastic polymers

are those, which contain a functional group (i.e., polar thermoplastic polymers), and Shiraki '784 illustrates various functional groups (see column 16, lines 19-64 of Shiraki '784).

Further, Shiraki '784 cites the polymer groups (1)-(11) on column 17, line 13 to column 21, line 41 as specific examples of favorably used polar thermoplastic polymers, wherein polyphenylene ether-type polymer is illustrated as (9) on column 20, line 53 to column 21, line 14.

However, Shiraki '784 neither discloses nor suggests that such a polyphenylene ether-type polymer should be reacted further with any one selected from a carboxyl group-containing compound, an acid anhydride group-containing compound and an epoxy group-containing compound. That is, the polyphenylene ether-type polymer illustrated in Shiraki '784 corresponds to an unreacted-polyphenylene ether. In other words, the polyphenylene ether has not been reacted with any one of the above-mentioned compounds as recited in the present claim 1.

As to polyolefin, Shiraki '784 illustrates ethylene-acrylic acid ionomer and propylene-ethylacrylate copolymer (on column 16, lines 30-31 and 35-36), and it describes that there can be used rubber-modified polymers obtained by copolymerizing the aliphatic unsaturated carboxylic acid and the other copolymerizable monomer (on column 17, lines 35-42).

However, as mentioned above, the present specification describes: (i) the polyolefin may be a copolymer of two or more compounds selected from ethylene, propylene and other  $\alpha$ -

olefins, which are substantially freed from a carboxyl group, an acid anhydride group, an epoxy group and other functional groups originated from a copolymerization monomer (see page 28, lines 5-10 of the present specification); and (ii) the polyolefin (for example, a copolymer having no specific functional group) should be reacted further with any one selected from a carboxyl group-containing compound, an acid anhydride group-containing compound and an epoxy group-containing compound. (The Examiner's attention is directed to inventive claims 8-10 and new claim 19.) This description of the present specification is contrary to the above-disclosure of Shiraki '784.

Shiraki '784 illustrates polymer (9) which is a polyphenylene ether-type polymer as a specific example of thermoplastic polymers including an ether group (see column 20, line 53 to column 21, line 14 of Shiraki '784). In the description, as styrene compounds to be graft-polymerized to the polyphenylene ether polymer, Shiraki '784 suggests the use of styrene,  $\alpha$ -methylstyrene, methylstyrene, tert-butylstyrene and chlorostyrene are cited. And, as other copolymerizable vinyl compounds, acrylic esters, methacrylic esters, acrylonitrile and methacrylonitrile are cited. This detailed description of Shiraki '784 is also quite silent about any specific functional group to be attached to the polyphenylene ether as defined in the present claims 1-3.

Contrary to the description of Shiraki '784, as explained above, the present claims 1-3 recite that a

polyphenylene ether and/or a polyolefin should be reacted with any one of the above-mentioned compounds having a specific functional group.

In describing the requirements for rejection of a claim by anticipation, the Manual of Patent Examining Procedure (Section 2131) states:

[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference (ref. omitted). The identical invention must be shown in as complete detail as is contained in the... claim (ref. omitted).

Furthermore, in *Ex Parte Levy*, 17 USPQ2d 1461 (BOPAI, 1990), the Board of Patent Appeals and Interferences has written:

[m]oreover, it is incumbent upon the Examiner to identify wherein each and every facet of the claimed invention is disclosed in the applied reference (ref. omitted).

Accordingly, Applicants respectfully indicate, every element in a claim must be found in the reference in order that the reference anticipates the claim. Since Shiraki '784 fails to disclose a resin composition comprising a polyphenylene ether and/or a polyolefin, which has been reacted with any one selected from a carboxyl group-containing compound, an acid anhydride group-containing compound and an epoxy group-containing compound, a *prima facie* case of anticipation cannot be said to exist. Therefore, the reference does not anticipate the claims, and as such, Applicants respectfully request that the anticipation rejection be withdrawn.

[III] Obviousness Rejection

As mentioned above, Shiraki '784 fails to teach or suggest all of the elements of claims 1-3. As the MPEP directs, all the claim limitations must be taught or suggested by the prior art to establish a *prima facie* case of obviousness. See MPEP § 2143.03. Since Shiraki '784 fails to teach or fairly suggest a resin composition comprising a polyphenylene ether and/or a polyolefin, which has been reacted with any one selected from a carboxyl group-containing compound, an acid anhydride group-containing compound and an epoxy group-containing compound, a *prima facie* case of obviousness cannot be said to exist.

Also, since Shibuya '997 fails to teach or fairly suggest a resin composition comprising a polyphenylene ether

and/or a polyolefin, which has been reacted with any one selected from a carboxyl group-containing compound, an acid anhydride group-containing compound and an epoxy group-containing compound, then it is clear that Shibuya '997 fails to cure the deficiencies of Shiraki '784. As such, withdrawal of the obviousness rejection is respectfully requested.

[IV] Claims 2 and 3

The following comments relate to the additional distinctions found in claims 2 and 3.

In the present claim 2, the resin composition containing the graft copolymer obtained above in accordance with the present claim 1 can be blended with another thermoplastic resin, namely a component (d), thereby obtaining a new polymer alloy. That is, the resin composition in accordance with the present claim 1 serves as a compatibilizer to the other thermoplastic resin. Furthermore, claim 3 recites a resin composition comprising the polymer alloy and an additional inorganic filler, namely a component (e).

An object of the present invention is to provide a resin composition, which is obtained by blending the agent serving both as a compatibilizer and an impact resistance-imparting agent with another thermoplastic resin, and which is superior in its impact resistance, particularly impact strength at low temperatures, heat resistance and processability (see page 8, lines 13-19 of the present specification).

As described in the present specification, the graft copolymer-containing resin composition in accordance with the present invention is the one obtained through the reaction of a specific modified hydrogenated block copolymer and a modified polyphenylene ether and/or a modified polyolefin. Therefore, it is possible to attain remarkably improved compatibility exhibited to both the polyphenylene ether component and the polyolefin component, which cannot be attained according to a conventional resin composition comprising a polyphenylene ether and/or polyolefin and a hydrogenated block copolymer. As a result, there can be provided a resin composition having improved layer separation and weld tensile strength, and moreover there can be provided a resin composition comprising the graft copolymer-containing resin composition and a thermoplastic resin different therefrom, which is improved in impact strength at low temperature and superior in heat resistance and processability, and which is very suitable as a molding material (claims 2 and 3). That is, the graft copolymer-containing resin composition itself serves as an excellent compatibilizer to the different thermoplastic resin.

The present claims 2 and 3 are totally different from Shiraki '784 and Shibuya '997 in the above points. Furthermore, Shiraki '784 and Shibuya '997 neither discloses nor suggests that the graft copolymer-containing resin composition serves as an excellent compatibilizer and thereby the physical properties such as impact strength at low



temperature and weld tensile strength of the resin composition are remarkably improved.

[V] Unexpected properties of the inventive composition

In addition, Applicants respectfully submit that the presently claimed resin composition containing a graft copolymer obtained using a functional group-containing polyphenylene ether (b) and/or a functional group-containing polyolefin (c) has unexpectedly improved properties over a resin composition prepared using a non-functionalized polyphenylene ether or non-functionalized polyolefin as described in Shiraki '784.

The Examiner's attention is directed to Tables 1 and 2 on pages 57-58 of the present specification, which include the data obtained from inventive examples 1 and 2 in Table 1 and Comparative Examples 6 and 7 in Table 2. Inventive Examples 1 and 2 were prepared with a functional group-containing polyphenylene ether (b-3) and (b-5), respectively, as described on page 48 of the specification. The Comparative Examples 6 and 7 were prepared using a non-functionalized polyphenylene ether (b-4) and (b-6) as described on pages 48 and 49 of the specification, respectively.

The values of weld tensile strength retention of the resin compositions of Inventive Examples 1 and 2 are 92% and 87%, respectively. On the other hand, the values of weld tensile strength retention of the resin composition of Comparative Examples 6 and 7 are 13% and 14%, respectively.

Such a comparison reveals that the resin composition according to the present invention is superior to the one according to Shiraki '784 in weld tensile strength retention (%).

In conclusion, even assuming *arguendo* that a *prima facie* case of obviousness were to exist, the unexpectedly superior properties of the inventive composition would overcome the *prima facie* case.

#### **Priority Documents**

On July 27, 2004, Applicants filed a Certified Copy of the instant priority document 2002-220188 (filed in Japan on July 29, 2002). In the next communication, Applicants respectfully request that the Examiner acknowledges receipt of the certified copy of the instant priority document.

#### **Conclusion**

In view of the above-comments, Applicants respectfully submit that the claims are in condition for allowance. A Notice to such effect is earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Garth M. Dahlen, Ph.D., Esq. (Reg. No. 43,575) at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or

credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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